May 8, 2012

Summary of Emission Point Modeling Using AERMOD Software

Saint-Gobain Performance Plastics Corp. McCaffrey Street Hoosick Falls Facility

Prepared for:

SAINT-GOBAIN PERFORMANCE PLASTICS CORP.
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SUMMARY OF EMISSION POINT MODELING USING AERMOD SOFTWARE
SAINT-GOBAIN PERFORMANCE PLASTICS CORPORATION
14 MCCAFFREY STREET FACILITY
VILLAGE OF HOOSICK FALLS, RENSSELAER COUNTY, NEW YORK

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1.0 PROJECT OVERVIEW

Saint-Gobain Performance Plastics Corp. (SGPPL) is currently in the process of applying for a revised New York State Department of Environmental Conservation (NYSDEC) Air Registration for their 14 McCaffrey Street plant in the Village of Hoosick Falls, Rensselaer County, New York. As a step in the permitting process, NYSDEC requested that the facility conduct air dispersion modeling of operations associated with Post-Cure Ovens planned for installation/modification in order to evaluate the level of impacts associated with these emissions from the facility. Estimated contaminant-specific hourly maximum and average hourly concentrations (on an annual basis) were derived from the model for acetone, benzene and formaldehyde, and are presented in tabular format in Section 3 of this report.

One of the parameters modeled under maximum operating conditions (benzene) did not meet the AGC established by the NYSDEC. Maximum operations would entail processing ±564 tons of material annually within the Post-Cure Ovens. The annual calculations previously submitted to the NYSDEC were based on capping the annual hours of operation of the ovens to 5,000 hours per year each. After initial discussions with the NYSDEC, the production limit has been revised from a limit on the number of hours to a limit on the tons of material processed in the Post-Cure Ovens. Limiting production in the Post-Cure Ovens to 215 tons per year has been selected as the limitation to be placed on the facility, and would result in a lower amount of annual emissions than previously requested. Since the model uses hourly emission numbers to assess the annual concentration data, an "alternate" hourly concentration was calculated by dividing the annual emissions resulting from this cap amount (emissions resulting from processing 215 tons of material in the Post-Cure Ovens) by 8,760 hours per year. The result is an annual hourly concentration which does not exceed the AGC for benzene.

2.0 SUMMARY OF MODEL INPUTS

2.1 Facility Design Parameters

Planned operational data for the Post-Cure Ovens at the facility was used as the basis for running the model. This data includes emission point parameters (diameter, flow rate, exit velocity, stack height and exit temperature) from the single emission point associated with the four ovens, all of which will remain unchanged as a result of the project. The model also incorporates the building footprint and heights of the various segments of the building, and includes results using the rural setting for the site and surrounding area.

2.2 Receptor Area Modeled

The modeling was conducted for the area in the vicinity of the SGPPL McCaffrey Street site, with the receptors oriented in a 71 x 71 Cartesian grid pattern with a 10 meter spacing between points in the east-west and north-south directions, excluding the area within the site boundaries. A total of 4,778 receptors were modeled under this scenario, covering an area of approximately 490,000 square meters (±121 acres). The modeling area was selected to be this large in order to account for all nearby areas. All receptor data corresponds to the interpolated ground level elevation (as calculated by AERMAP). The receptor grid areas are shown by the graphical representations included in Figure 3, which depict the concentration results from the model. For the purposes of the air dispersion modeling, AERMAP was used to assign elevations to the receptor grid points. No discrete receptors such as schools or nursing homes were identified to fall within close proximity to the facility, and no elevated receptors were modeled within this area. No educational facilities were identified within the modeling area.

2.3 AERMAP Data Input

The AERMAP terrain preprocessor utilized USGS 7.5 Minute Native Format DEM topographical data for the Hoosick Falls, New York quadrangle, data which provides a resolution of 10 meters. Copies of the AERMAP source, receptor, and output files utilized for this modeling are included on the enclosed disc. A topographic map

depicting the site and surrounding area is included as Figure 1. A map depicting the facility including the emission point modeled, which was used as the basis for constructing the AERMOD model, is included as Figure 2.

2.4 AERMET Data Input

The AERMET meteorological preprocessor utilized surface and upper air data for the years 2004-2008 for the Albany Airport as supplied by the NYSDEC.

2.5 AERMOD Data Input

Emissions estimates for the Post-Cure Ovens on-site were generated based on planned actual operations at the facility once the installation/replacement of two ovens occurs. The emission point is configured such that it collects the exhaust from the four Post-Cure ovens and exits the building through one stack.

Using the emission point data, the layout of the building and the property line for the facility, the model is able to calculate the concentration of each contaminant from the emission point.

The modeling scenario does not consider wet or dry deposition which would deplete mass from the plume. The model does consider complex terrain through incorporating the AERMAP program into the modeling scenario. USGS topographical data was imported into the modeling software to account for the complex terrain (i.e., those areas where the terrain exceeds the stack base elevation).

A summary of the model inputs for the maximum expected facility emissions is as follows:

Table 1 – Summary of Facility Emission Data Used in Modeling

CAS Number	Contaminant	Emissions (lb/hr)	Emissions (g/sec)
50-00-0	Formaldehyde	0.0046	0.00058
67-64-1	Acetone	0.238	0.0300
71-43-2	Benzene (no limit)	0.191	0.0241
71-43-2	Benzene (with limit)	0.0728	0.00948

3.0 SUMMARY OF MODELING RESULTS

The AERMOD modeling analysis performed takes into account the Post-Cure Oven operations currently contemplated for the facility. Modeling data includes the dimensions and footprint of the facility building, as well as specific information relative to the emission point from which the ovens are exhausted. The model incorporates topographical data from the USGS, and meteorological data from the Albany Airport.

The results of the modeling software were subsequently compared to the AGC and SGC values for individual contaminants as determined by the New York State Department of Environmental Conservation (NYSDEC), and as listed within the NYSDEC document titled "DAR-1 AGC/SGC Tables" (last revised October 18, 2010).

A summary of the modeled maximum hourly concentration and annual hourly concentrations, as well as a comparison of those values to the established SGC and AGC are presented below. The table shows that the maximum expected levels of emissions will not result in concentrations which exceed limits established by the NYSDEC for acetone and formaldehyde, which were developed intending to be protective of human health and the environment. It is noted that for benzene, unlimited production at the hourly maximum emission levels would result in exceeding the AGC for this compound. SGPPL has elected to limit production at the Post-Cure Ovens such that the annual hourly concentration for benzene will not be exceeded. For benzene, the model was re-run using an hourly concentration calculated by dividing the annual limit (±364 pounds based on 215 tons of product processed in Post-Cure ovens annually) by 8,760 hours per year.

Table 2 – Summary Of Concentration Data From Modeling

CAS Number	Contaminant	Max. Concentration (ug/m^3)		SGC (ug/m^3)	AGC (ug/m^3)	% of SGC	% of AGC
		1-Hour	Annual				
50-00-0	Formaldehyde	0.12	0.0081	30	0.06	0.40	13.50
67-64-1	Acetone	6.21	0.419	180,000	30,000	0.0035	0.0014
71-43-2	Benzene (no limit)	4.98	0.336	1,300	0.13	0.38	258.5
71-43-2	Benzene (with limit)	1.90	0.128	1,300	0.13	0.15	98.46

By limiting the annual amount of material processed in the Post-Cure ovens to 215 tons, the facility will limit the annual hourly concentration of benzene to levels below the AGC.

3.1 Locations of Maximum Concentration Receptors

The locations of the receptors for the maximum concentrations for the contaminants modeled are summarized in the table below. The chart lists the contaminants arranged according to the receptor location. It is noted that different locations were obtained through the modeling software for the maximum hourly concentration receptors and the annual hourly concentration receptors.

- Maximum Hourly Receptor (634071.69, 4750302.50) – Area located west of site, undeveloped area located between facility and the Hoosic River.
- Maximum Annual Receptor (634172.06, 4750489.50) – Area located north of site along McCaffrey Street.

3.2 Additional Modeling Information

Stack information, including emissions data and stack parameters is included in Table 3.

Table 3 – Summary Of Stack Parameters Used in Modeling

Emission Point	Height (ft.)	Diameter (in.)	Contaminants Modeled	Exit Temp (°F)	Velocity (ft/sec)	Flow Rate (ACFM)
EP003	52.5	18	3	120	53.25	5646

Figure 1

Topographic Map of Site and Surrounding Area

MAP REFERENCE
United States Geological Survey
7.5 Minute Series Topographic Map
Quadrangle: Hoosick Falls, N.Y. (2011)

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FIGURE 1 SITE LOCATION MAP

SAINT-GOBAIN PERFORMANCE PLASTICS
MCCAFFREY STREET HOOSICK FALLS, NY FACILITY

VILLAGE OF HOOSICK FALLS	RENSSELAER COUNTY, NY
SCALE: ±1:24,000	
DRAFTER: JAF	
PROJECT No. 02.8298	

Figure 2

Plant Site Map Depicting Building and Emission Point

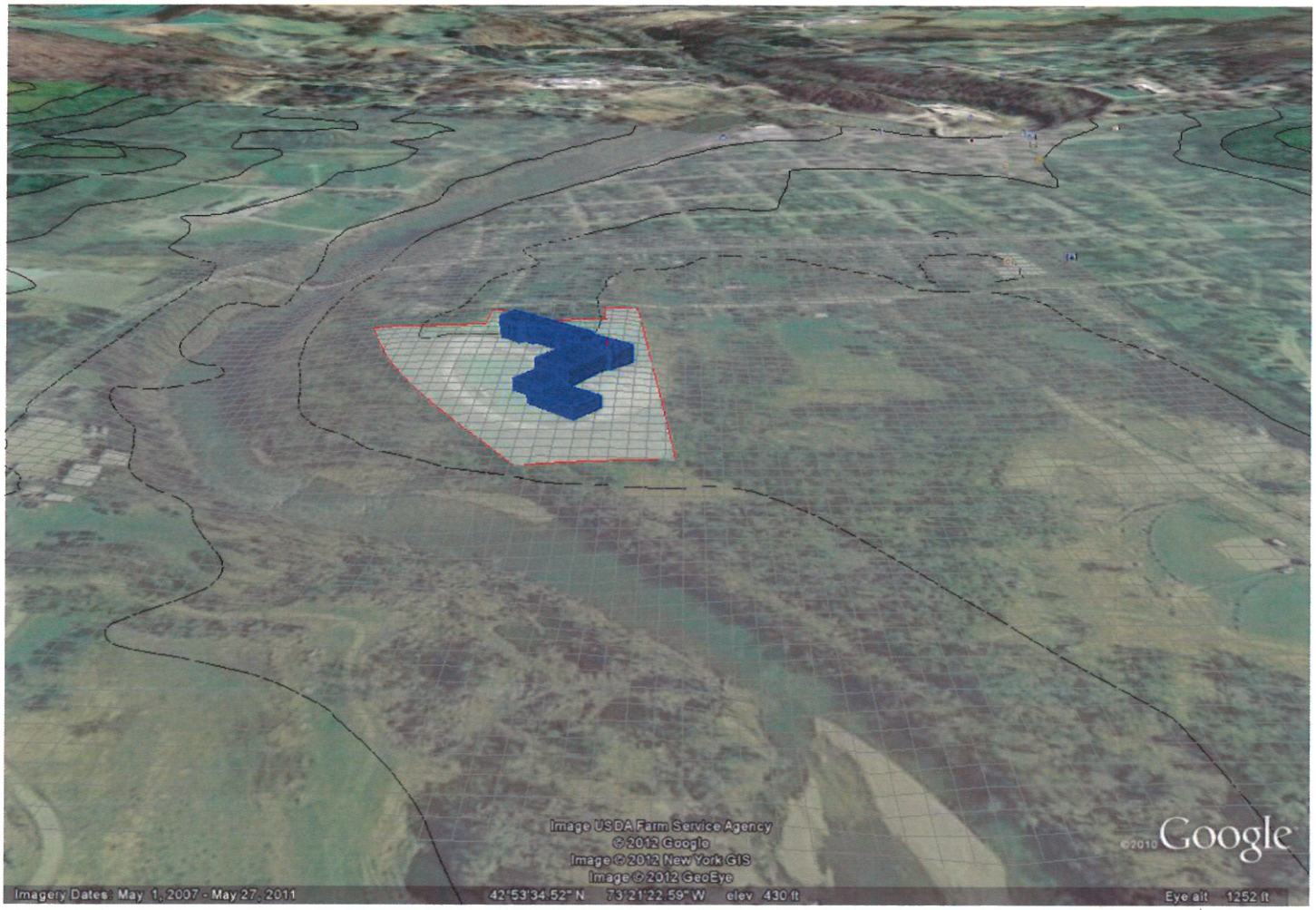
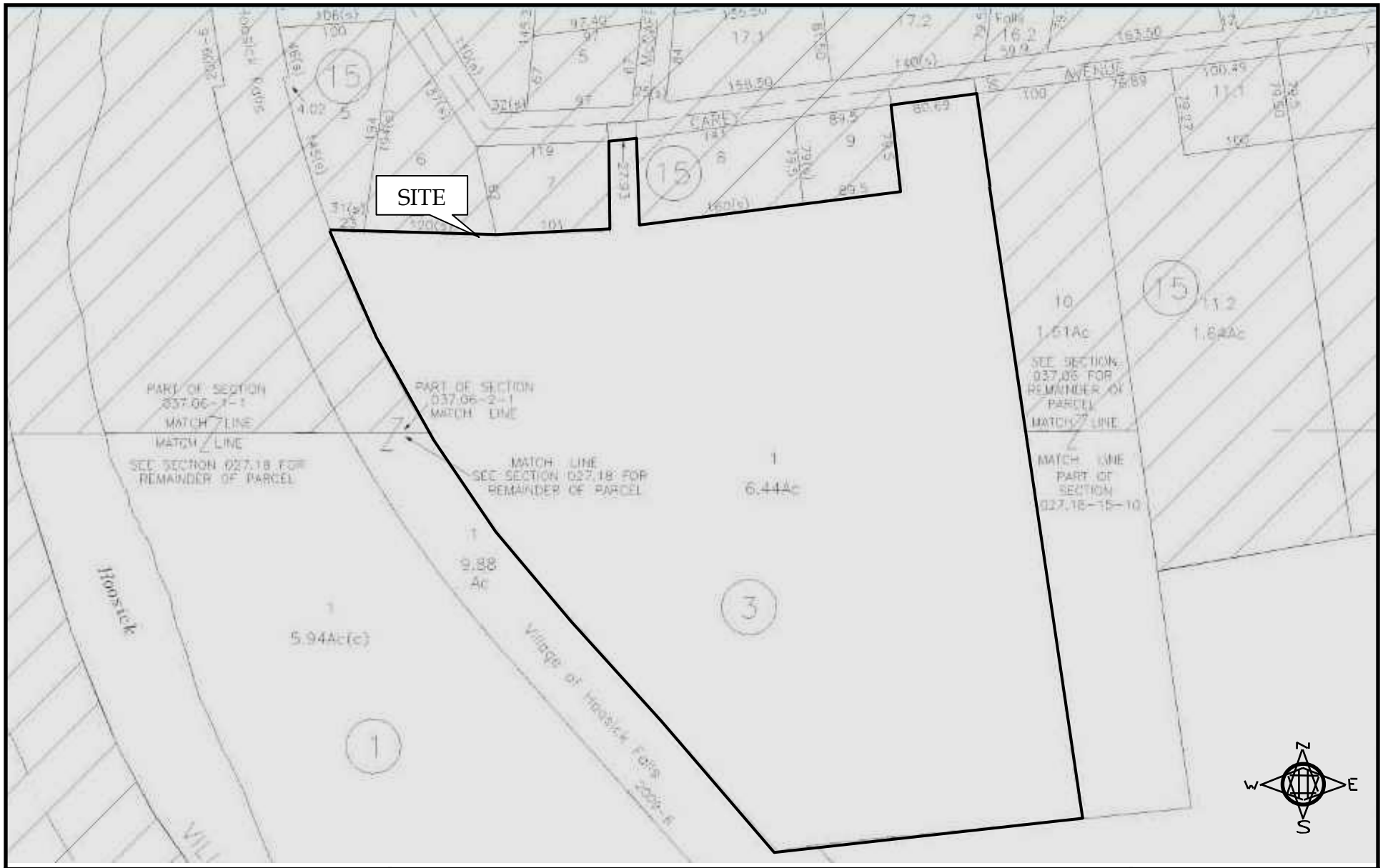


Image USDA Farm Service Agency
© 2012 Google
Image © 2012 New York GIS
Image © 2012 GeoEye
©2010 Google
Imagery Dates: May 1, 2007 - May 27, 2011
42°53'34.52" N 73°21'22.59" W elev 430 ft
Eye alt 1252 ft



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DEPICTION OF SITE PROPERTY LINES
SAINT-GOBAIN PERFORMANCE PLASTICS
MCCAFFREY STREET HOOSICK FALLS, NY FACILITY

Map Reference:
Village of Hoosick Falls
Tax Map 37.06, 3/1/09

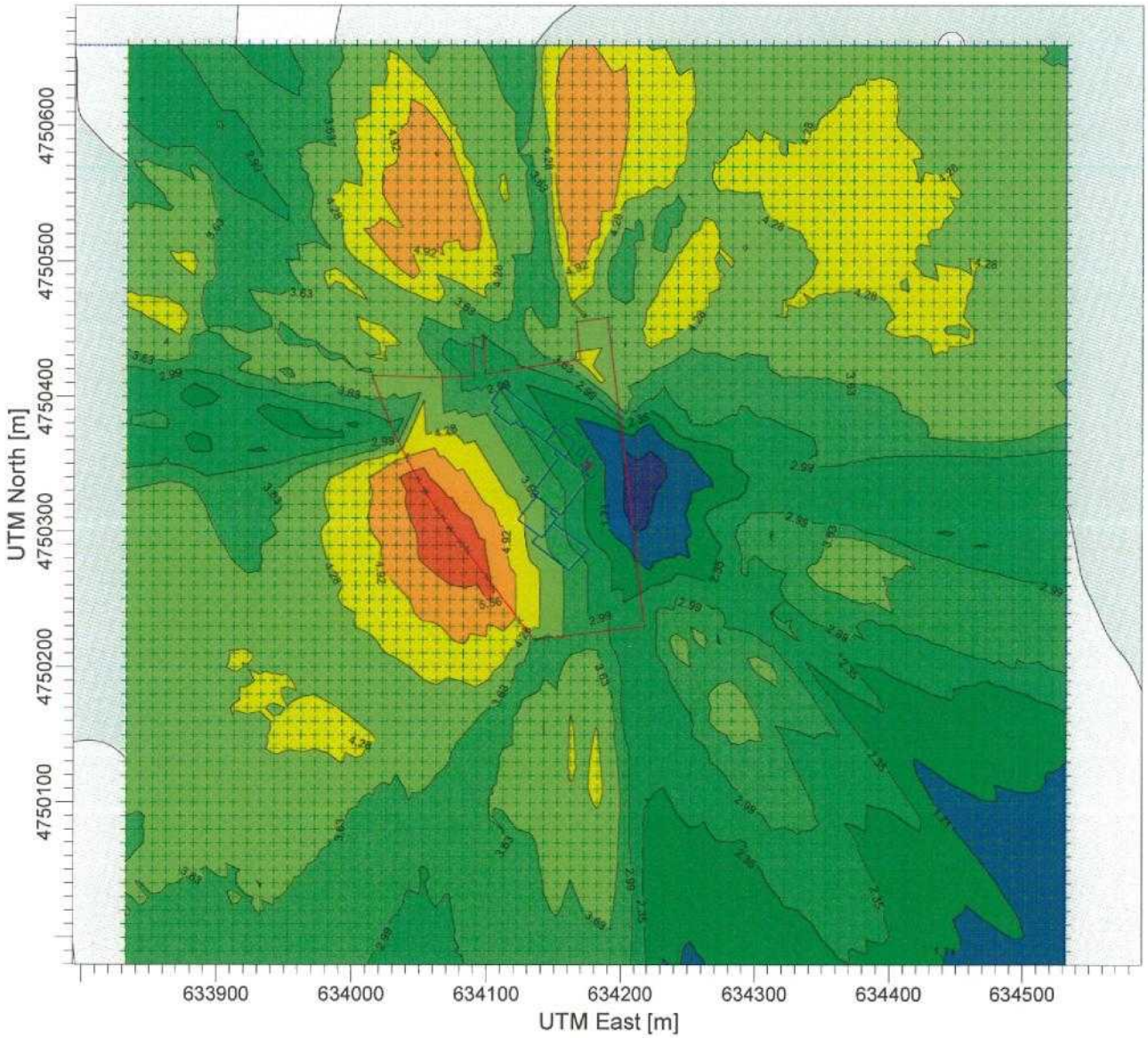
Village of Hoosick Falls	Rensselaer County, New York	Date: May 2012
Scale: As Shown	CTMA Project No.: 02.8298	Drafter: JAF

Figure 3

Modeling Outputs

PROJECT TITLE:

SGPPL McCaffrey Street Hoosick Falls Air Dispersion Modeling
Summary of Maximum Hourly Concentration



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

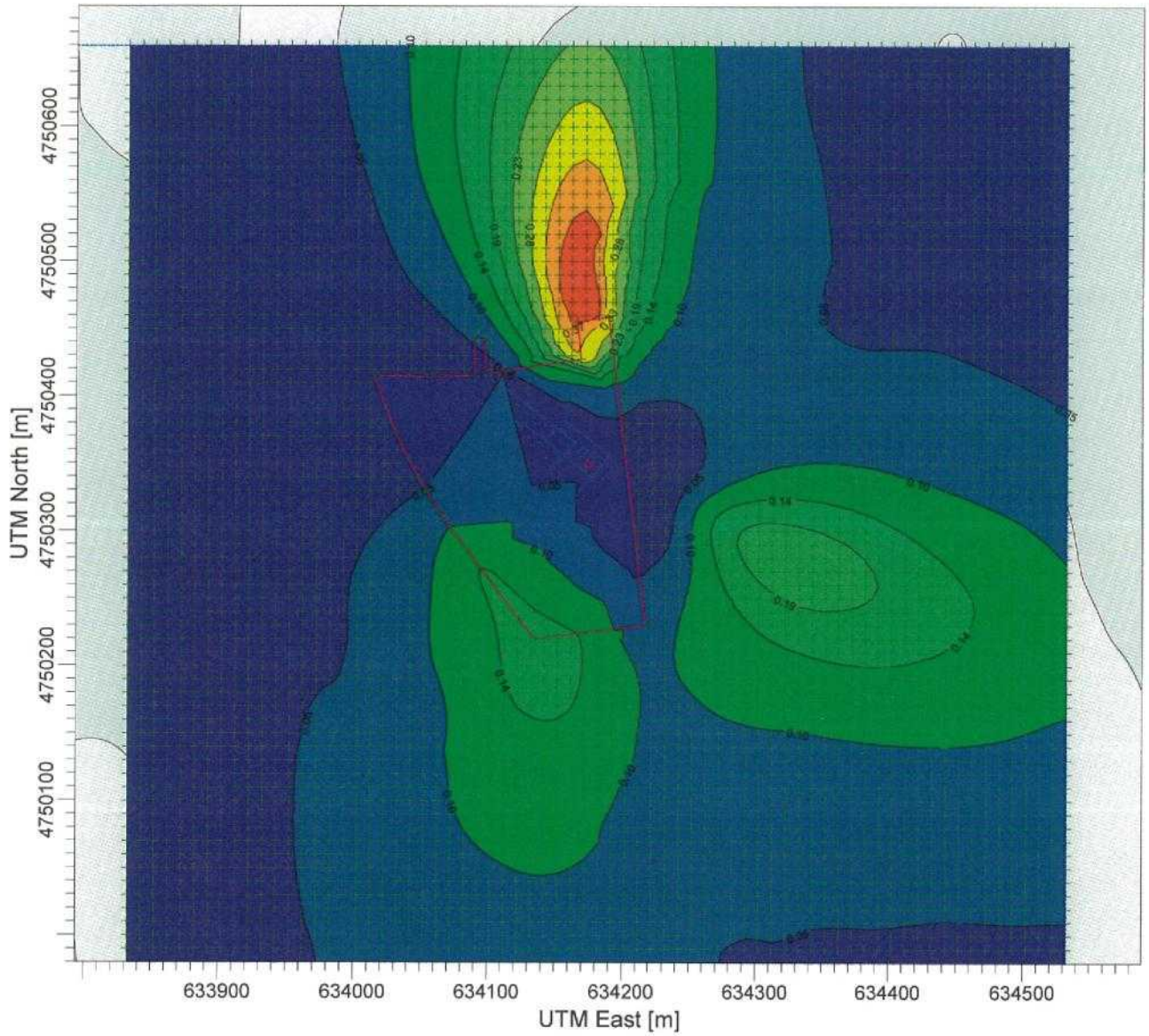
ug/m^3

0.421 0.421 1.064 1.707 2.349 2.992 3.635 4.278 4.920 5.563 6.206

COMMENTS: Chemical: Acetone CAS No.: 67-64-1 SGC = 180,000 ug/m3	SOURCES: **1**	COMPANY NAME: **C.T. Male Associates**	
	RECEPTORS: **4778**	MODELER: **CTM Staff**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,000 0 0.1 km	
	MAX: **6.2057 ug/m^3**	DATE: **5/7/2012**	PROJECT NO.: **02.8298**

PROJECT TITLE:

SGPPL McCaffrey Street Hoosick Falls Air Dispersion Modeling
Summary of Annual Hourly Concentration



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

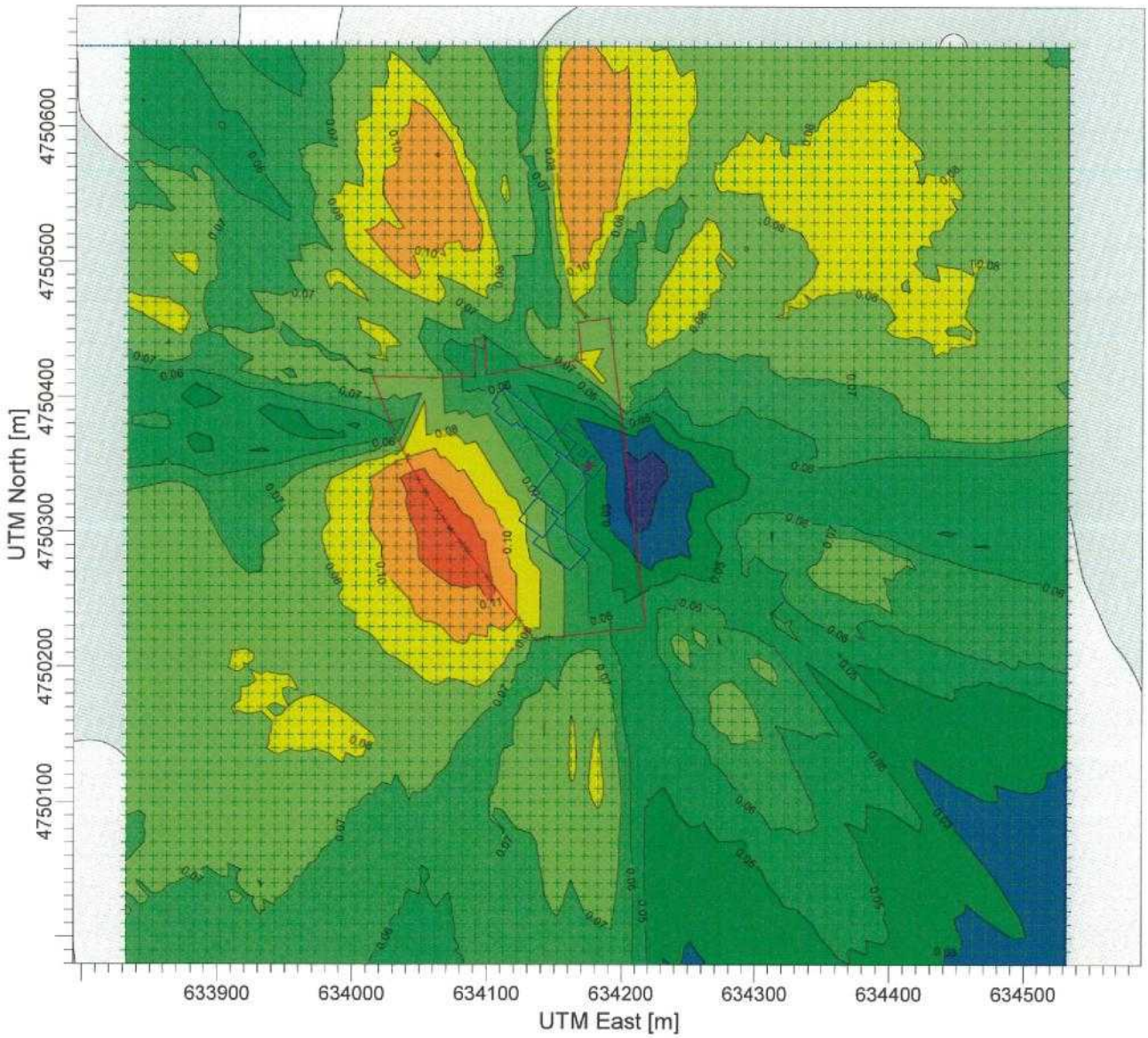
ug/m^3

0.003 0.003 0.049 0.095 0.141 0.188 0.234 0.280 0.326 0.373 0.419

COMMENTS: Chemical: Acetone CAS No.: 67-64-1 AGC = 30,000 ug/m3	SOURCES: **1**	COMPANY NAME: **C.T. Male Associates**	
	RECEPTORS: **4778**	MODELER: **CTM Staff**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,000 0 0.1 km	
	MAX: **0.41885 ug/m^3**	DATE: **5/8/2012**	PROJECT NO.: **02.8298**

PROJECT TITLE:

SGPPL McCaffrey Street Hoosick Falls Air Dispersion Modeling
Summary of Maximum Hourly Concentration



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

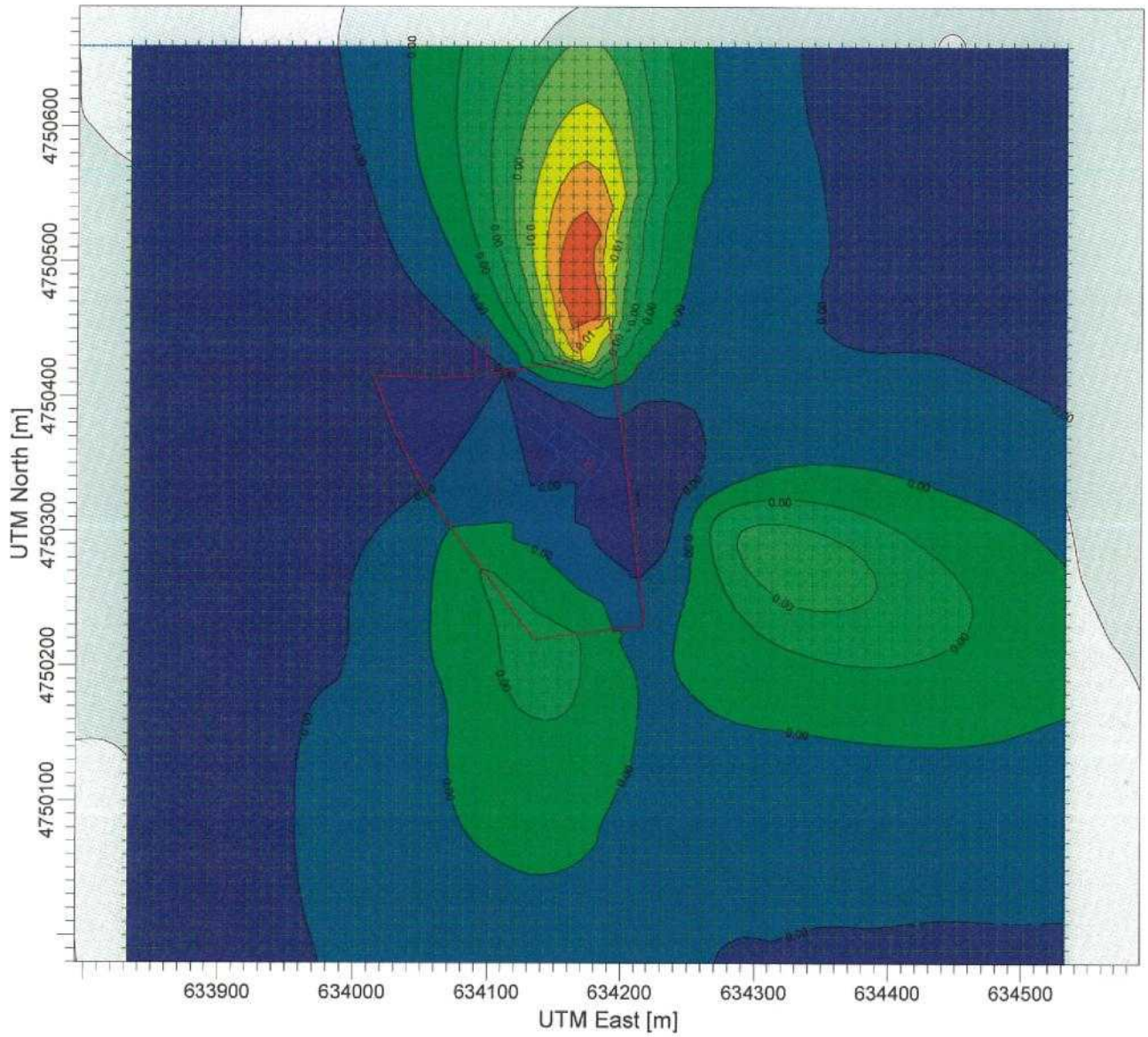
ug/m^3

0.008 0.008 0.021 0.033 0.045 0.058 0.070 0.083 0.095 0.108 0.120

COMMENTS:	SOURCES:	COMPANY NAME:	
Chemical: Formaldehyde CAS No.: 50-00-0 SGC = 30 ug/m3	1	C.T. Male Associates	
	RECEPTORS:	MODELER:	
	4778	CTM Staff	
	OUTPUT TYPE:	SCALE: 1:5,000	
	Concentration	0 0.1 km	
	MAX:	DATE:	PROJECT NO.:
	0.12003 ug/m^3	5/7/2012	02.8298

PROJECT TITLE:

SGPPL McCaffrey Street Hoosick Falls Air Dispersion Modeling
Summary of Annual Hourly Concentration



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

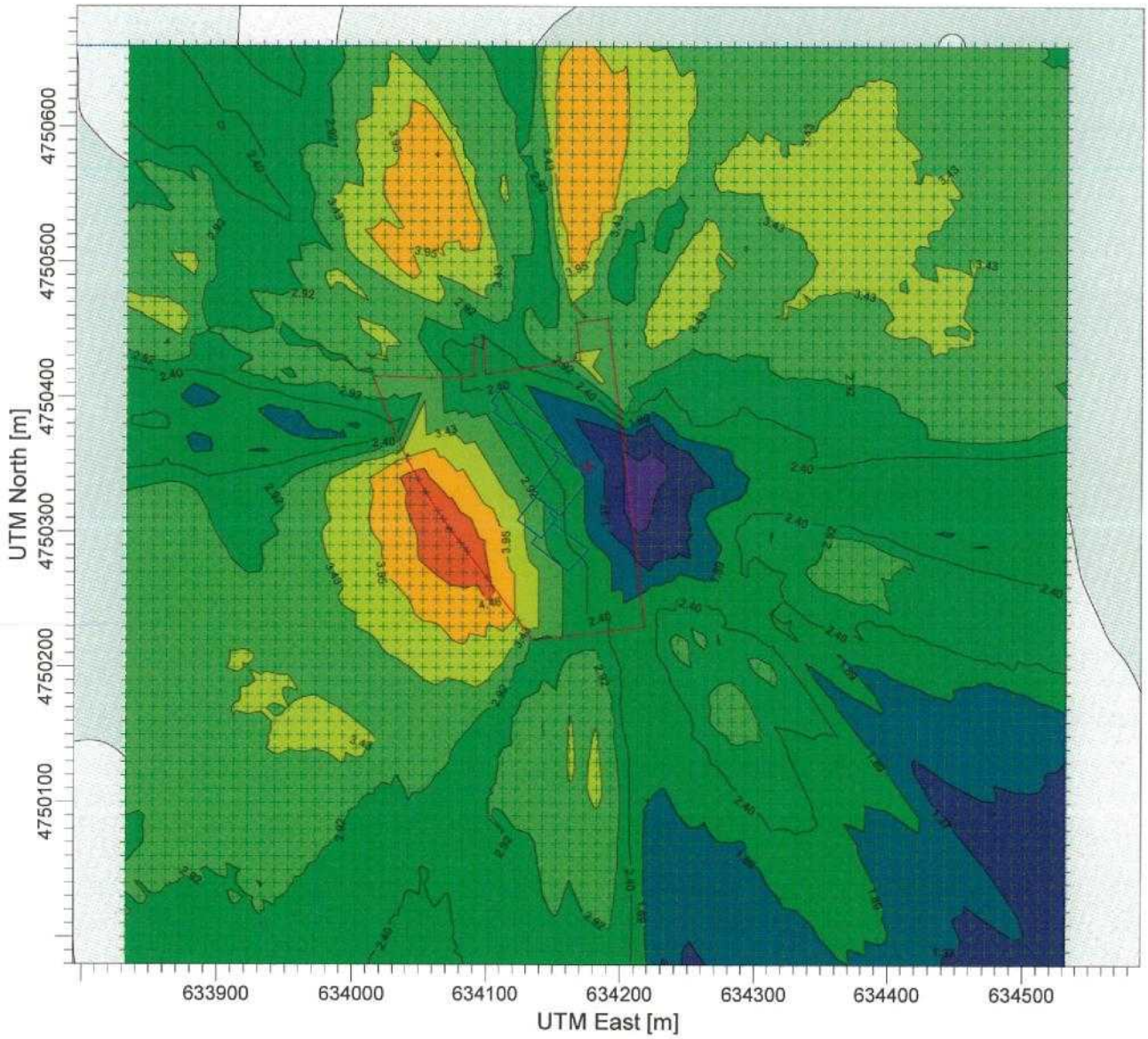
ug/m^3

0.000 0.000 0.001 0.002 0.003 0.004 0.005 0.005 0.006 0.007 0.008

COMMENTS: Chemical: Formaldehyde CAS No.: 50-00-0 AGC = 0.06 ug/m3	SOURCES: 1	COMPANY NAME: C.T. Male Associates	
	RECEPTORS: 4778	MODELER: CTM Staff	
	OUTPUT TYPE: Concentration	SCALE: 1:5,000 0 0.1 km	
	MAX: 0.0081013 ug/m^3	DATE: 5/8/2012	PROJECT NO.: 02.8298

PROJECT TITLE:

SGPPL McCaffrey Street Hoosick Falls Air Dispersion Modeling
Summary of Maximum Hourly Concentration



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

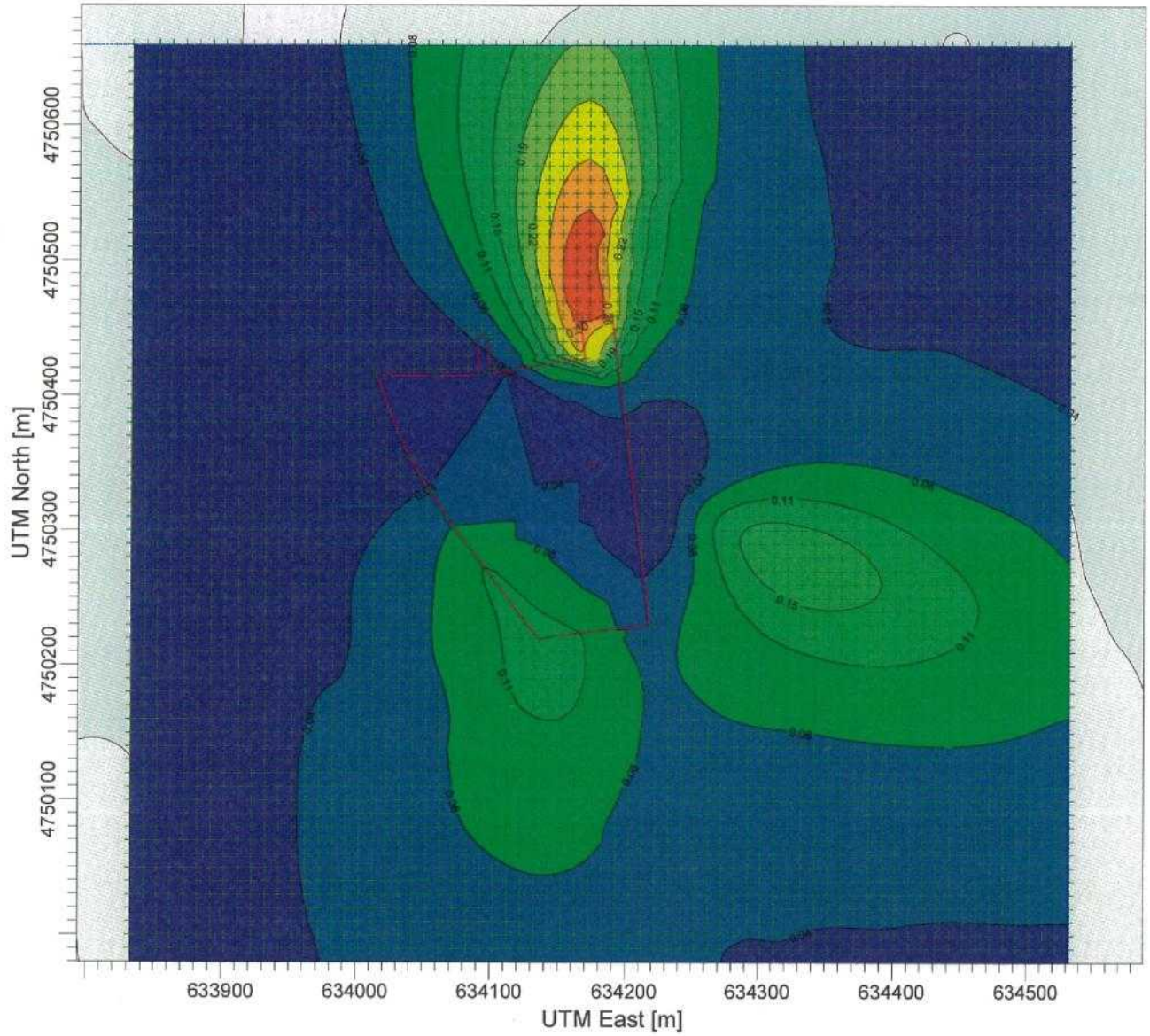
ug/m^3

0.338 0.854 1.370 1.886 2.401 2.917 3.433 3.949 4.465 4.980

COMMENTS:	SOURCES:	COMPANY NAME:	
Chemical: Benzene CAS No.: 71-43-2 SGC = 1,300 ug/m3 (No Cap on Production)	1	C.T. Male Associates	
	RECEPTORS:	MODELER:	
	4778	CTM Staff	
	OUTPUT TYPE:	SCALE: 1:5,000	
	Concentration	0 0.1 km	
	MAX:	DATE:	PROJECT NO.:
	4.9804 ug/m^3	5/8/2012	02.8298

PROJECT TITLE:

SGPPL McCaffrey Street Hoosick Falls Air Dispersion Modeling
Summary of Annual Hourly Concentration



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

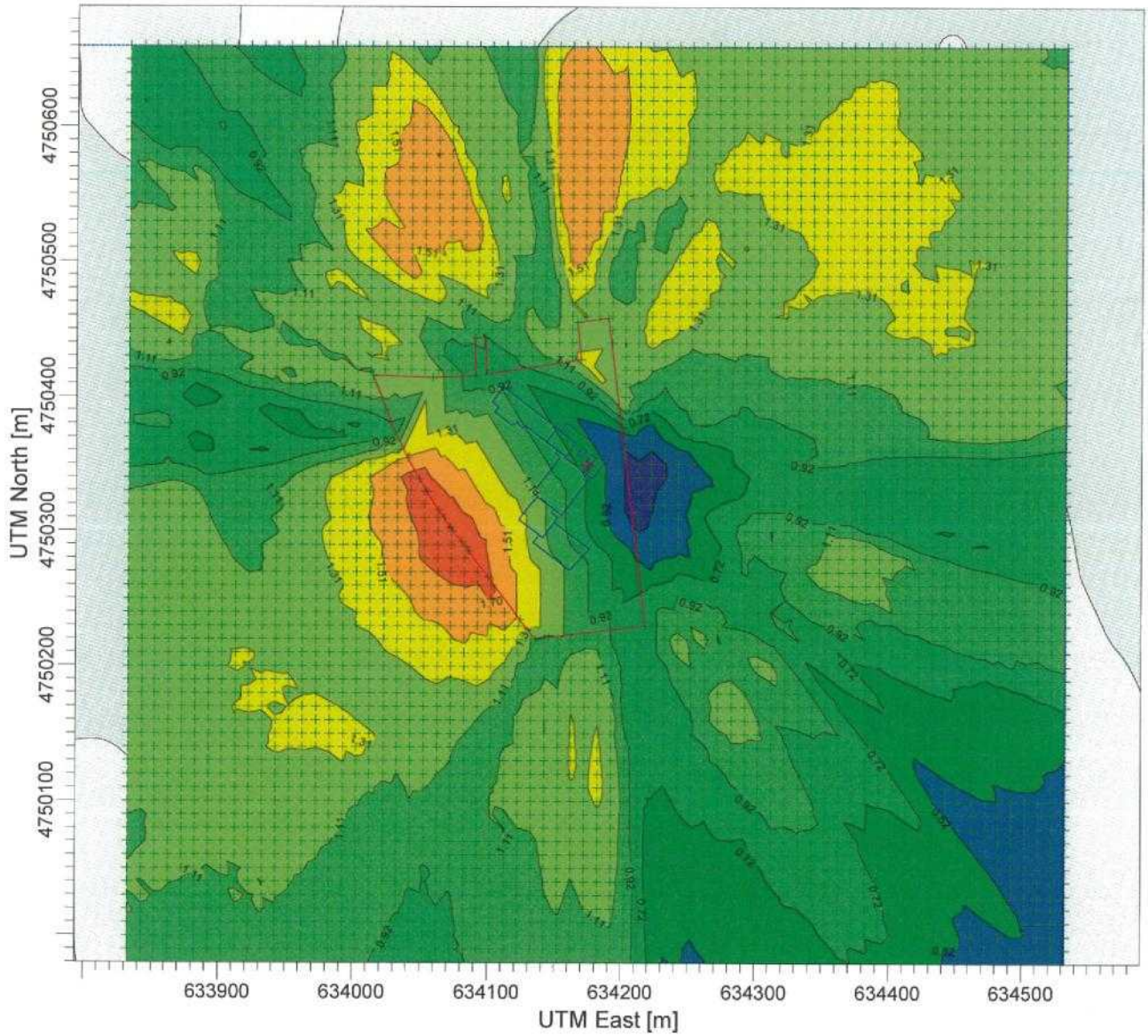
ug/m^3

0.002 0.002 0.039 0.076 0.113 0.151 0.188 0.225 0.262 0.299 0.336

COMMENTS:	SOURCES:	COMPANY NAME:	
Chemical: Benzene CAS No.: 71-43-2 AGC = 0.13 ug/m3 (No Cap on Production)	1	C.T. Male Associates	
	RECEPTORS:	MODELER:	
	4778	CTM Staff	
	OUTPUT TYPE:	SCALE: 1:5,000	
	Concentration	0 0.1 km	
	MAX:	DATE:	PROJECT NO.:
	0.33615 ug/m^3	5/8/2012	02.8298

PROJECT TITLE:

SGPPL McCaffrey Street Hoosick Falls Air Dispersion Modeling
Summary of Maximum Hourly Concentration



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

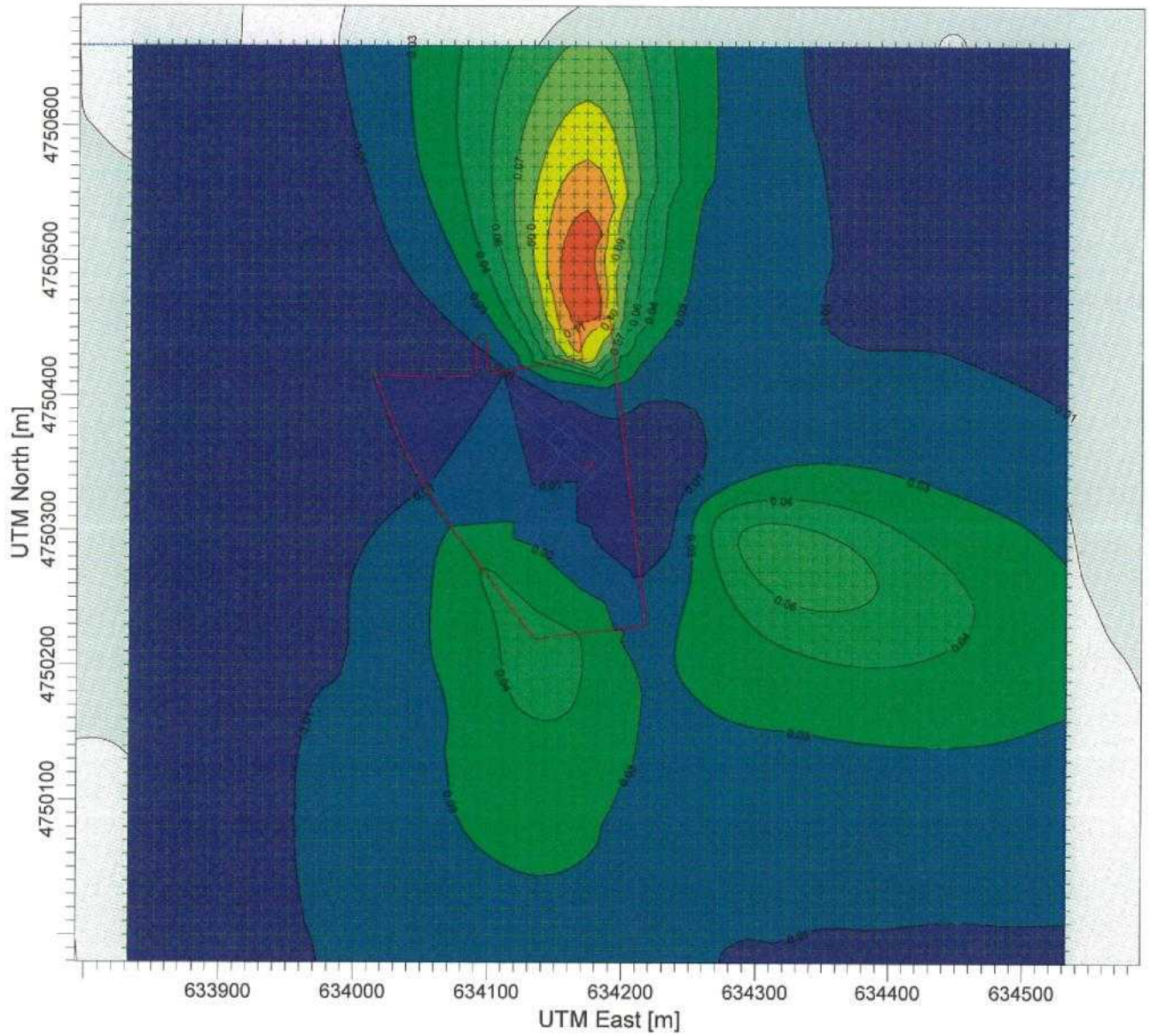
ug/m^3

0.129 0.129 0.326 0.522 0.719 0.915 1.112 1.309 1.505 1.702 1.899

COMMENTS: Chemical: Benzene CAS No.: 71-43-2 SGC = 1,300 ug/m3 (With Cap on Production)	SOURCES: **1**	COMPANY NAME: **C.T. Male Associates**	
	RECEPTORS: **4778**	MODELER: **CTM Staff**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,000 0 0.1 km	
	MAX: **1.8985 ug/m^3**	DATE: **5/7/2012**	PROJECT NO.: **02.8298**

PROJECT TITLE:

SGPPL McCaffrey Street Hoosick Falls Air Dispersion Modeling
Summary of Annual Hourly Concentration



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.001 0.001 0.015 0.029 0.043 0.057 0.072 0.086 0.100 0.114 0.128

COMMENTS: Chemical: Benzene CAS No.: 71-43-2 AGC = 0.13 ug/m3 (With Cap on Production)	SOURCES: 1	COMPANY NAME: **C.T. Male Associates**	
	RECEPTORS: **4778**	MODELER: **CTM Staff**	
	OUTPUT TYPE: **Concentration**	SCALE: 1:5,000 0 0.1 km	
	MAX: **0.12814 ug/m^3**	DATE: **5/8/2012**	PROJECT NO.: **02.8298**